

Response to Office Action
Serial No. 09/957,395
Page 2 of 12

In The Claims:

1. (Currently Amended) A method of making an optical waveguide, comprising providing a substrate comprising a semiconductor layer disposed on a first insulating layer;
forming an opening through said semiconductor layer to said first insulating layer;
depositing a core material on said first insulating layer to fill said opening,
wherein said core material contacts said semiconductor layer along a side of said opening;
removing excess core material; and
depositing a top cladding layer over the core material.
2. (Previously Presented) A method according to claim 1 wherein said semiconductor layer comprises at least one material selected from the group consisting of silicon, silicon-germanium, gallium arsenide, indium gallium arsenide and indium phosphide.
3. (Previously Presented) A method according to claim 1 wherein said semiconductor layer is silicon.
4. (Previously Presented) A method according to claim 3 wherein said first insulating layer and said top cladding layer are of silicon oxide, each layer having a different refractive index.
5. (Original) A method according to claim 1 wherein excess core material is removed by chemical mechanical polishing.
- 6-8. (Cancelled)

304881

Response to Office Action
Serial No. 09/957,395
Page 3 of 12

9. (Previously Presented) A method according to claim 1 wherein said substrate further comprises:

a second insulating layer having the first insulating layer disposed thereon.

10. (Previously Presented) A method according to claim 9, wherein the second insulating layer and the first insulating layer are comprised of the same material.

11. (Previously Presented) A method according to claim 9, wherein the second insulating layer is comprised of glass.

12. (Previously Presented) A method according to claim 9, wherein the second insulating layer is comprised of silicon oxide.

13. (Currently Amended) A method according to claim 1, wherein the first insulating layer forms further comprising: a bottom cladding layer disposed in the opening and having a refractive index different than the top cladding layer.

14. (Previously Presented) A method according to claim 13, wherein the bottom cladding layer is comprised of glass.

15. (Previously Presented) A method according to claim 9, wherein the core material forms an optical waveguide cladded by the first insulating layer and the top cladding layer.

16-20. (Cancelled)

21. (Currently Amended) A method of making an optical waveguide, comprising:
providing a substrate comprising a silicon semiconductor layer disposed on a first insulating layer;

304881

Response to Office Action
Serial No. 09/957,395
Page 4 of 12

forming an opening through said semiconductor layer to said first insulating layer;
filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and

depositing a top cladding layer over the core material, wherein said first insulating layer and said top cladding layer are of silicon oxide, each layer having a different refractive index.

22. (Currently Amended) A method of making an optical waveguide, comprising:
providing a substrate comprising a semiconductor layer, a first insulating layer, and a second insulating layer, the semiconductor layer disposed on [[a]] the first insulating layer and the first insulating layer disposed on the second insulating layer;

~~second insulating layer having a first insulating layer disposed thereon;~~

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and

depositing a top cladding layer over the core material, wherein the second insulating layer and the first insulating layer are comprised of the same material.

23. (Currently Amended) A method of making an optical waveguide, comprising:
providing a substrate comprising a semiconductor layer, a first insulating layer, and a second insulating layer, the semiconductor layer disposed on [[a]] the first insulating layer and the first insulating layer disposed on the second insulating layer, wherein the second insulating layer is comprised of glass;

~~second insulating layer having a first insulating layer disposed thereon, wherein the second insulating layer is comprised of glass;~~

Response to Office Action
Serial No. 09/957,395
Page 5 of 12

forming an opening through said semiconductor layer to said first insulating layer;
filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and
depositing a top cladding layer over the core material.

24. (Currently Amended) A method of making an optical waveguide, comprising:
providing a substrate comprising a semiconductor layer, a first insulating layer,
and a second insulating layer, the semiconductor layer disposed on [[a]] the first
insulating layer and the first insulating layer disposed on the second insulating layer,
wherein the second insulating layer is comprised of silicon oxide;

~~second insulating layer having a first insulating layer disposed thereon, wherein~~
~~the second insulating layer is comprised of silicon oxide;~~

forming an opening through said semiconductor layer to said first insulating layer;
filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and
depositing a top cladding layer over the core material.

25. (Currently Amended) A method of making an optical waveguide, comprising:
providing a substrate comprising a semiconductor layer, a first insulating layer,
and a second insulating layer, the semiconductor layer disposed on [[a]] the first
insulating layer and the first insulating layer disposed on the second insulating layer;

~~second insulating layer having a first insulating layer disposed thereon;~~
forming an opening through said semiconductor layer to said first insulating layer;
filling said opening with a core material, wherein said core material contacts said semiconductor layer along a side of said opening;

Response to Office Action
Serial No. 09/957,395
Page 6 of 12

removing excess core material such that an upper surface of the core material is disposed substantially even with an upper surface of the semiconductor layer; and depositing a top cladding layer over the core material, wherein the core material forms an optical waveguide cladded by the first insulating layer and the top cladding layer.

304881